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Cloud Computing Server Operating System Availability Enhancement by Utilizing the USB Flash and SD Card Devices

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Abstract- Cloud computing is rapid growing revolution in the way of information technology. As it grows rapidly providing high availability is a major task. This paper examines the cloud computing in the context of how it provides high availability by utilizing USB devices in the servers and explores the revolutionary transformations and challenges it brings to IT management.

Index Terms- SaaS, PaaS, IaaS, VMs.

I. INTRODUCTION

Cloud computing enlargement has taken all the attention of various communities like researches, student, business, consumer and government organizations. Cloud Computing is a marketing term which is also known as utility, computing, deliver the service as software, platform and infrastructure as a service in pay-as-you-go model to consumers. Berkeley report says on this services as "Cloud computing, the long held dream of computing as a utility, has the potential to transform a large part of the IT industry, making software even more attractive as a service" [4]. However, the basic idea behind the cloud model is that anything that could be done in computing whether on an individual PC or in a corporate data center from storing data to collaborating on documents or crunching numbers on large data sets can be shifted to the cloud. Certainly, cloud computing enables a new platform and location-independent perspective on how we communicate, collaborate and work. So long as you can access the Web, you are able to work when and where you wish. With fast, reliable Internet connectivity and computer power, it does not matter where the document, the e-mail or the data the user sees on the screen comes from.

Cloud computing enables providers to use distant data centers for cloud computing. Still, while some have predicted the end of the PC era with the rise of the cloud computing model, many believe that most organizations and even individuals will continue to make use of traditional PCs and laptops, even if more and more of their use will be to access the cloud [1].

Many organizations embrace both public and private cloud computing by integrating the two models into hybrid clouds. These hybrids are designed to meet specific business and technology requirements, so that activities and tasks are allocated to traditional IT, external or internal clouds, as appropriate, helping to optimize security and privacy with a minimum investment in fixed IT costs.

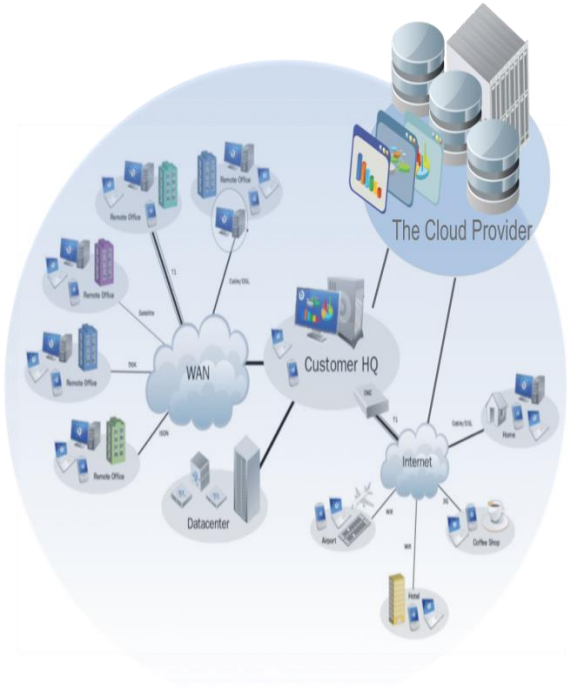

Figure: Cloud computing and Cloud storage

In addition to the different cloud computing models, there are distinctions among the most common cloud service models as shown in Figure 1. Available to anyone with Internet access, cloud service models include:

●Software as a Service (SaaS) cloud model Enables software to be delivered from a host source over a network as opposed to installations or implementations.

●Platform as a Service (PaaS) cloud model Enables operating systems and middleware services to be delivered from a managed source over a network.

●Infrastructure as a Service (IaaS) cloud model Enables the entire infrastructure to be delivered as a service over a network, including storage, routers, virtual systems, hardware and servers.

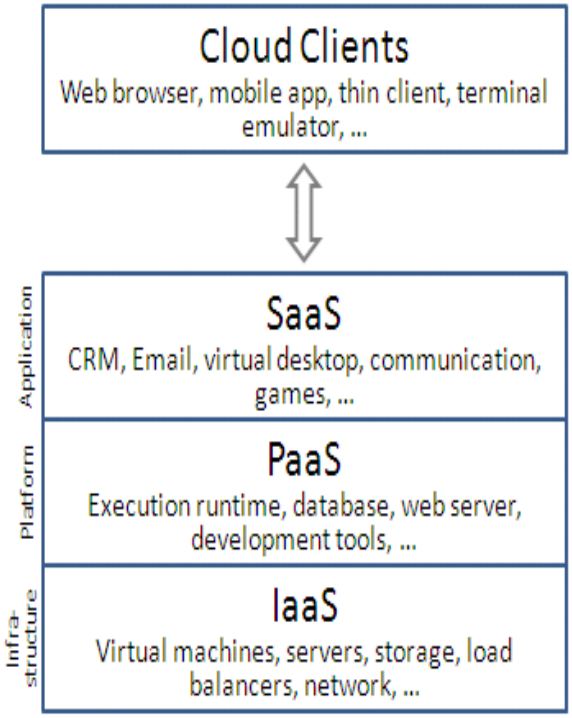

Figure 1: Cloud computing service models

II. Cloud Infrastructure as a Service (IaaS).

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components [7].

2.1Virtualization

One of the main cost-saving, hardware-reducing, and energy-saving techniques used by cloud providers is virtualization. Virtualization is done with software-based computers that share the underlying physical machine resources among different virtual machines (VMs). With OS virtualization each VM can use a different operating system (OS), and each OS is isolated from the others. Many companies use VMs to consolidate servers, enabling different services to run in separate VMs on the same physical machine. VMs allow time-sharing of a single computer among several single-tasking operating systems. Utilizing VMs requires the guest operating systems to use memory virtualization to share the memory of the one physical host. Memory Virtualization removes volatile random access memory (RAM) resources from individual systems and aggregates those resources into a virtualized memory pool available to any computer in the cluster. Memory virtualization leverages large amount of memory which improves overall performance, system utilization, and increased efficiency. Allowing applications on multiple servers to share data without replication also reduce the total amount of memory needed [6].

2.2 Computing and Storage

Data centers have emerged in the past few years as a new paradigm for interconnecting computing and storage on a massive scale. There are several viewpoints from which to approach the development of data centers: as the outgrowth of large web server farms (for web-hosting), as the convergence of computing and networking (high-performance computing as typified by the Cloud Computing paradigm) and as a convergence of local area networks and storage networks. Several technological innovations have spurred the rapid deployment of data centers; notably, 10 Gbps Ethernet technology, the specification of Fiber Channel over Ethernet (FCoE) standards, server virtualization, and the development of high-performance Network Interface Cards (NICs) [5].

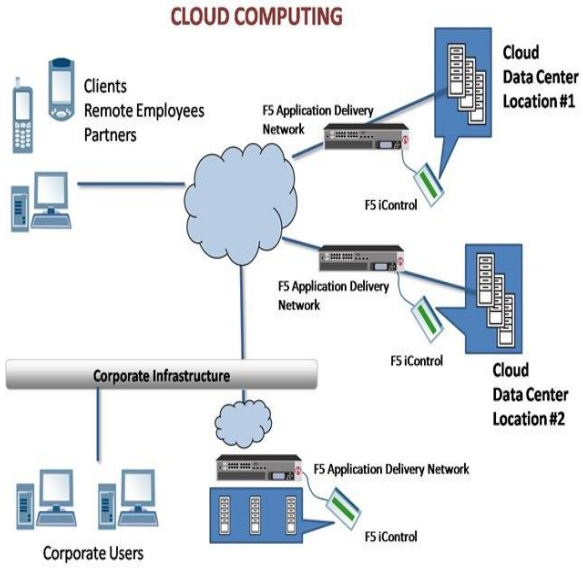

Figure: Data center managed services

While cloud computing models are attractive because of their flexibility and cost effectiveness, certain challenges must be addressed in order to provide a viable option to traditional data services.

The externalized aspect of outsourcing can make it harder to maintain data integrity and privacy, support data and service availability, demonstrate compliance, and secure highly available access to applications and information. In short, cloud computing can present an added level of risk.

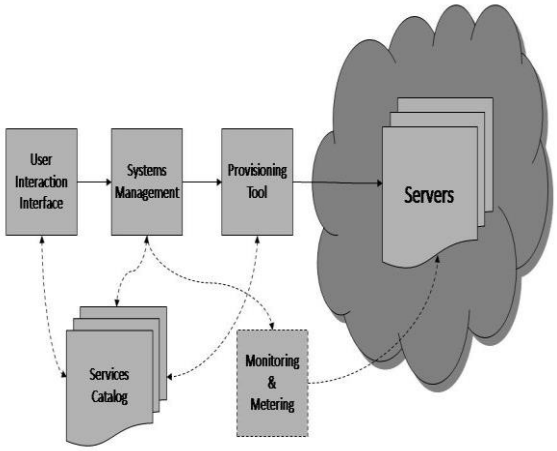

Figure: Server Management Architecture

In contrast, high availability can be achieved through software that runs on top of an operating system, through the chosen server architecture or even as a feature within the application itself. Applications that have high-availability properties built in eliminate the need to run additional software. High-availability systems are often designed to quickly recover from a component failure within the architecture, sometimes with a very limited amount of application downtime or with a period of degraded capacity, while the failed components are quickly resolved.

Since availability of servers is the major issue in the cloud computing. Failure or crashing of any operating system leads to increase the downtime. For this USB Flash and SD cards are used as recovery. Server operating system is installed on USB devices which are need to be connected to the server hardware. After installation of operating system set the boot sequence order of server with hard disk(From where the current Server operating system is booted), USB flash and SD card. If there is failure or crash occurs in the present operating system then the operating system will recover from the USB devices. This will increases the performance rate of the system by reducing the down time of server.

III. Conclusion

This paper described the cloud computing can be used to address strategic problems with which IT continually deals like availability and reliability. Computing in the context of how it provides high availability by utilizing USB devices in the Servers. The advantages are clear with the main ones being resiliency, efficiency, scalability, flexibility and easier outsourcing. Cloud computing genuinely does have the potential to radically change the way organizations purchase, manage and provide computing resources to their employees.

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